chronic disease news

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Centre for Control of Chronic Diseases in Bangladesh

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JOHNS HOPKINS BLOOMBERG SCHOOL of PUBLIC HEALTH
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Editorial

Dear Readers,

Welcome to the fourth issue of Chronic Disease News which will update you on the activities of the Centre for Control of Chronic Diseases in Bangladesh (CCCDB) since May 2010.

Together with our partners from BRAC University James P Grant School of Public Health and the Institute of Development Studies, we are pleased to report the successful first round of our MPH-Plus programme, with six bright students successfully completing the programme between March and August of this year.

In September, we welcomed Dr Louis Wilhelmus Niessen to the CCCDB, where he has taken up his post as its head. Professor Niessen is an associate professor in the Department of International Health at the Johns Hopkins Bloomberg School of Public Health and a professor at the University of East Anglia, UK. A public health researcher and health economist, Dr Niessen is one of a small number of academics who combine experience of chronic diseases in both resource-poor and high-income countries. His specific areas of expertise are the prevention and treatment of diabetes, cardiovascular disease, stroke, lung disease, and also some infectious diseases.

Covered in this issue of the newsletter are the early findings of a pilot study that the Centre has conducted on the prevalence of diabetes and prediabetes among adults in urban and rural Bangladesh. We include further details of our MPH-Plus programme and the results of a systematic review undertaken into the interaction between chronic disease and poverty in low and middle-income countries. Finally, we cover the inauguration of the International Childhood Cancer Forum. Co-hosted with the British Columbia Cancer Agency, Canada, together with other partners from Canada, Bangladesh, the UK, and Japan, the objective of this workshop was to set priorities for combating childhood cancer in Bangladesh.

I hope you enjoy this issue of the Chronic Disease News.

Alejandro Cravioto
Executive Director, ICDDR,B

Undiagnosed or newly-diagnosed diabetes and prediabetes among adults in urban and rural Bangladesh: preliminary findings from a pilot study

Diabetes and prediabetic conditions (impaired fasting glucose or impaired glucose tolerance) affect a significant proportion of the adult population in developed and developing countries. However, a large proportion of those affected remain undiagnosed for a long time and only come to know when there is a complication or they are diagnosed from a blood test for another medical condition. This has implications for both treatment and prevention.

Both diabetes and prediabetes are strong risk factors for cardiovascular diseases. The risk is considered to be continuous and associated positively with increased concentration of blood glucose. Diabetes and prediabetes are often missed when based on random blood sugar or fasting blood sugar concentration criteria. The gold standard for glucose abnormality diagnosis is the oral glucose tolerance test (OGTT). This provides a measure of how efficiently an individual deals with a glucose load over a specified time generally over a two-hour period.

To find out the undiagnosed or first time prevalence of diabetes and prediabetes among adults, a group of researchers from ICDDR,B and Eminence Associates recently conducted a study both in an urban middle-class setting in the Mirpur area of Dhaka city and in rural Matlab and measured glucose metabolic status using OGTT. The study population included both males and females aged 20 years or above.

In total, 1243 individuals – 517 from urban Mirpur and 726 from rural Matlab – participated in the study. In both settings, over two thirds were female participants. Lower male representation, particularly in <50 years old, was mainly due to their time constraints as the participation required at least three hours for responding to the questionnaire and also to measure blood glucose at both fasting and two hours after 75 g oral glucose administration.

Table. Distribution of age, body mass index, and glucose metabolic abnormality in adults aged 20 years or above in urban Mirpur and rural Matlab, Bangladesh

	Urban Mirpur, Dhaka			Rural Matlab, Chandpur		
	Total (n=517)	Male (n=185)	Female (n=334)	Total (n=726)	Male (n=178)	Female (n=548)
Age (y)	41.3	44.3	39.6	41.7	42.6	41.3
BMI (kg/m^2)	25.9	24.7	26.6	21.0	20.3	21.2
Glucose metabolic status						
Normal (%)	68.9	69.4	68.6	84.7	88.8	83.4
Prediabetes (%)	19.1	18.0	19.8	12.7	9.0	13.9
Diabetes (%)	12.0	12.6	11.7	2.6	2.2	2.7

Fig. 1. Prevalence of diabetes and prediabetes among males by BMI

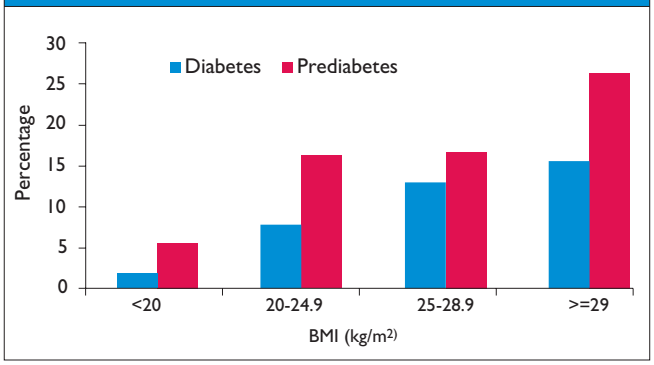
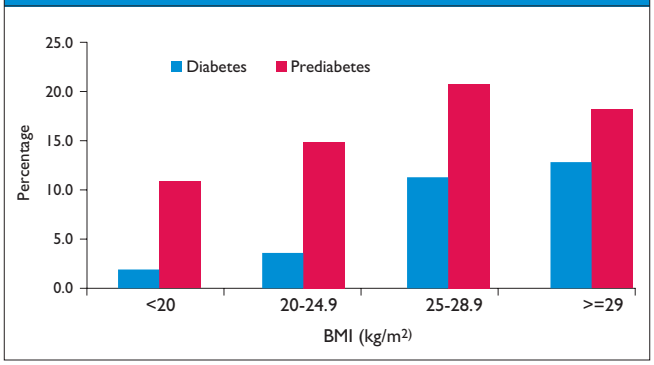


Fig. 2. Prevalence of diabetes and prediabetes among females by BMI



On average, the participants were 41 years old with average body mass index (BMI)* of 23 kg/m^2 , although urban participants were heavier than rural ones.

Results

The study shows, both diabetes and prediabetes prevalence were extremely high in the urban compared to the rural population (see table given at page 2).

Diabetes prevalence was more than four times higher in the urban compared to the rural population, although both males and females were equally susceptible in both settings. Prediabetes rate was also higher in the urban compared to the rural population; although there was no significant difference between males and females in urban Mirpur, females had higher prediabetes rate in Matlab.

In summary, nearly one third of the urban population, and one in every six adults in the rural population had glucose abnormality, either diabetes or prediabetes.

Both diabetes and prediabetes increased in higher BMI groups; that is those with more body mass had higher rates. For example, diabetes was prevalent among 1.8% males and 2.0% females with BMI <20 while the rate of diabetes was 12.8% and 11.7% respectively among those with BMI 25-29. The rate of diabetes was even higher in obese (BMI>29) individuals, with 15.8% males and 13.2 percent of females suffering from diabetes. Similarly, the rate of prediabetes also increased with increased BMI in both males and females.

This might explain the difference in diabetes prevalence between urban and rural samples.
The mean BMI of the Matlab participants was only 21 while that of the Mirpur participants was 26. Co-morbid conditions such as diabetes/prediabetes and high blood pressure in the same individuals was found among 21% of participants having diabetes. Although half of the male participants were smokers, only a few women reported any smoking habit.

This alarming rate of diabetes and prediabetes in people who otherwise consider themselves as normal and healthy require immediate attention and should be considered in any primary prevention programme for diabetes in Bangladesh.

**Body Mass Index (BMI): It is calculated as weight (kg)/ height^2 (m^2), it is the most widely-used diagnostic tool to identify weight problem including underweight, overweight and obesity within a population.*

Dr Dewan S Alam
Head, Non-communicable Disease Unit
HSID

CCCDB completes first year of MPH-Plus programme

As a part of its commitment to encourage more research on chronic diseases, the Centre for Control of Chronic Diseases in Bangladesh (CCCDB) has introduced a six-month long MPH-Plus programme titled 'Certificate in Advanced Research Methods.'

The programme is being organised in collaboration with the James P Grant School of Public Health of BRAC University and the Institute of Development Studies in the UK.

The overall goal of this programme is to develop a critical mass of MPH graduates with advanced knowledge and expertise in chronic diseases, and the skills to design and carry out research in this area.

It is intended to further strengthen the research capacity of ICDDR,B and the BRAC School in the area of chronic diseases.

With a better understanding of the epidemiologic and health system research of chronic diseases, it is hoped that the participants will contribute significantly to the prevention and control of chronic diseases in Bangladesh.

Each year, six candidates are taken in this MPH-Plus programme for a period of six months. The programme has six short courses (each with 2 credits). The participants will write an independent research paper on a relevant topic (with 3 credits) and also participate in relevant ongoing research project in ICDDR,B or BRAC School of Public Health.

This year, six MPH graduates from BRAC JPG School of Public Health were selected for the programme and completed it successfully with six months of extensive and hands-on training facilitated by international and national supervisors. The course took place between March and August this year.

Three of the interns under this programme attended the National Heart, Lung and Blood Institute's Global Health Initiative Steering Committee Meeting in late October in the USA and also visited the National Institutes of Health in USA.

The courses of MPH-Plus programme:

i. Cardiovascular and pulmonary epidemiology in developing countries
ii. Chronic disease management in developing countries
iii. Biostatistics II
iv. Managing complex data sets
v. Advanced ethical issues in developing country research
vi. Writing research paper
vii. Independent research paper on challenges of chronic diseases in developing countries, based on primary or secondary data analysis

Childhood cancer focus of international workshop in Dhaka

With childhood cancer, one of the major threats to children in developing countries, the CCCDB helped organise a two-day international workshop this March to set priorities in the area of cancer research and intervention.

Each year in Bangladesh, there are an estimated 7000–9000 new cases of childhood cancer, with less than 500 of them receiving hospital treatment. Along with the lack of any proper childhood cancer registry, this means that most child cancer patients die without proper diagnosis and any proper medical treatment.

Against this backdrop, the conference, entitled International Childhood Cancer Forum: Exploration and Setting Priorities for an Unmet Need in Bangladesh was organised by the CCCDB, in conjunction with the British Columbia Cancer Agency, Vancouver, Canada, the Bangladesh Medical Research Council, Dhaka, the International Centre for Diarrheal Disease Research, Bangladesh (ICDDR,B), the Centre for International Child Health, British Columbia Children's Hospital, Vancouver, Canada, the Teenage and Young Adult Cancer, University of Manchester, UK and the EHIME University, Japan.

Leading researchers, health professionals and policy makers from Bangladesh and international arena participated in the workshop to discuss the childhood cancer situation in local and global perspectives.

Held at ICDDR,B's Sasakawa Auditorium in Dhaka, the event's chief guest was Dr Captain (Retd) Mozibur Rahman Fakir, the State Minister in the Bangladesh Ministry of Health and Family Welfare. Mr Robert McDougall, the High Commissioner for Canada and Dr Serguei Diorditsa, the acting WHO representative in Bangladesh, were present as special guests. The workshop was coordinated by Dr Syed Azizur Rahman from the Canadian Centre for Applied Research in Cancer Control (ARCC).

Dr Golam Mohiuddin Faruque, Associate Professor in the Department of Radiotherapy, Dhaka Medical College and Hospital, made the keynote presentation on the Childhood Cancer Situation in Bangladesh.

Throughout the workshop, international experts also shared their views and experiences. Professor Tim Eden from the University of Manchester in England offered an international perspective, while Dr Stuart Peacock, Co-Director of the Canadian Centre for Applied Research in Cancer Control, highlighted the global health and cancer control perspective from British Columbia.

Dr Charles P Larson, the director of the Centre for International Child Health in Canada and Dr Paul J Rogers of the University of British Columbia, Vancouver, spoke on the initiatives taking place at the British Columbia Children's Hospital.

The participants in the technical sessions of this two-day workshop discussed issues relating to identifying what should be the future cancer research and intervention priorities, as well as the clinical treatment and care.

Interaction between chronic disease and poverty in low- and middle-income countries

Chronic diseases are the leading cause of death and disability worldwide, representing a serious threat to human health and development. According to the World Health Organisation, chronic diseases, particularly cancers, diabetes and chronic respiratory and cardiovascular diseases, are the world's biggest killers, causing an estimated 35 million deaths each year, 60% of all deaths globally – with 80% in low and middle-income countries.

In low- and middle-income countries, middle-aged adults are particularly vulnerable to chronic diseases, undermining the countries' economic development.

Disease and poverty interact. Poor countries tend to be less healthy than better-off countries. Within countries, poor people experience worse health than rich people. This association is found for most chronic diseases by most measures of socioeconomic development – whether by income, education, occupation, or social class.

A group of collaborating researchers from Johns Hopkins Bloomberg School of Public Health (JHSPH), the developed-country partner of CCCDB, conducted a systematic review of poverty and chronic disease interaction. Reviewing a total of 132 articles, they found that the most researched risk factors are obesity (43 studies), hypertension (24 studies), tobacco use (17 studies), alcohol (5 studies), and physical inactivity (4 studies). Amongst diseases, cancers are the most frequently studied (29 studies) followed by diabetes mellitus (19 studies). Amongst the quantitative studies looking at the poverty to chronic disease pathway, the review classified two-thirds (92/122) as 'cross-sectional without any controls', one study as a 'nested case-control study' and 11 as 'uncontrolled before-after or time series studies.' Applying a crude excess risk summary measure across indentified recent high-grade identified studies , the review found that the majority of studies show a positive association between poverty and chronic diseases.

The review concludes that poverty and ill-health affect each other in both directions: poverty breeds ill-health, and ill-health makes poor people poorer. It is a vicious circle.

POVERTY ⟷ CHRONIC DISEASE

There is also evidence in high-income countries that the poor carry a higher burden of most chronic diseases, though there is much less evidence for this from developing countries. However, in low-income countries, smoking prevalence is higher among poorer quintiles of the population or those with the lowest levels of education. Heavy alcohol use is also more likely to occur among the poor in most low-income countries, though the patterns are less consistent for physical inactivity or type 2 diabetes. A recent review on obesity found that it is becoming more common among low- and middle-income countries and is shifting its distribution towards the poor at lower levels of national per capita income, particularly for women.

Chronic diseases can also cause impoverishment through loss of wages, missed schooling, or through medical expenditure. The consumption of goods that actually cause chronic illness, such as tobacco or alcohol can also increase poverty.

There is no direct evidence showing how increased expenditure from chronic diseases causes poverty, although there are a number of studies from low-income countries that show that the treatment for chronic diseases is beyond the financial capacity of the poor and other studies that show they have to spend large proportions of their household incomes to meet the medical costs.

Vicious circle of diseases and poverty

Chronic diseases show a specific dynamic in the interaction of ill-health and poverty, especially in developing countries.

Firstly, as they are not curable, chronic diseases are suffered over a large proportion of the patient's life. This results in prolonged treatment and long-term use of health services.

Secondly, the diseases' may affect people in their prime, economically-productive years, unlike infections that usually only afflict the very old or the very young. So, chronic disease may more often result in loss of sources of income for households.

Thirdly, continued disability due to chronic disease hampers sufferers' productivity and further threatens subsequent income generation, especially in the absence of social safety nets.

Finally, existing health systems in developing countries are not geared to treating chronic diseases, further compounding the health difficulties faced by patients.

Poverty leads to ill-health, as poverty is a major determinant of premature mortality and ill-health. International comparisons show a strong association between economic indicators such as gross domestic product (GDP) and life expectancy, although with increasing health return over the decades. Within individual countries for which data exist, lower socio-economic groups experience higher rates of death from most diseases, at any given age, compared to affluent groups. Poverty may affect health through numerous intermediate factors. Most of the major direct causes of chronic diseases – tobacco, high-risk sex, poor nutrition – are strongly related to poverty.

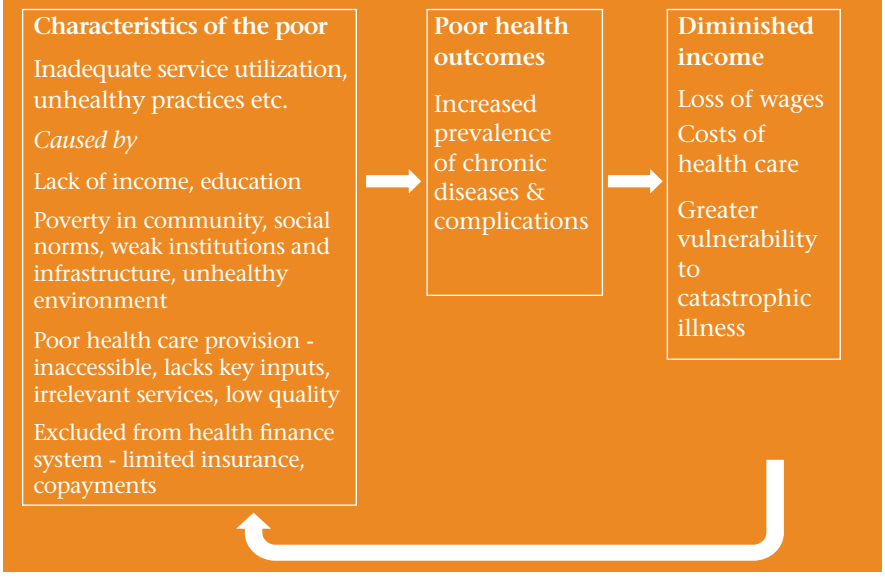
Ill-health also leads to poverty as disease and chronic ill-health cause both suffering and death and have a high financial cost to the family. Disease may lead to high out-of-pocket (OOP) expenditure for patients and their families, and also decreases the capacity to generate income and, hence, jeopardizes future wealth and welfare. When insurance is lacking, households with severe and urgent medical needs spend a large fraction of the household budget on healthcare by cutting back on the consumption of other goods and services, increase the amount of money loans, utilizing savings or selling assets. 'Catastrophic payments' are defined to occur when OOP payments are more that 10% (although it may vary from 5% to 20%) share of household expenditure or when 40% of 'discretionary expenditure' is spent i.e. the household expenditure excluding food. For families, actual expenditure may highly fluctuate as actual health events and need for healthcare is largely unpredictable.

Better health may reduce poverty, and reduction of poverty may lead to better health. This interrelationship has been the focus of attention of policy makers and researchers alike. To develop effective policies to combat both poverty and diseases, more insights are needed on the interaction between poverty and chronic diseases, especially with a focus on leading risk factors and major diseases.

The review also shows that the body of research on the relationship between chronic diseases and poverty in low- and middle-income countries is based on cross-sectional studies. Most follow-up studies find a positive association between poverty and chronic disease. There is a need to develop long-term follow-up research in low- and middle-income countries to help address the dynamics between poverty and chronic disease.

Extracts from: Mohan D, Niessen LW, Akuoku J, Trujillo A, and Peters D: Poverty and chronic diseases – a systematic review. Background paper [manuscript forthcoming].

Vicious circle of poverty and chronic diseases (authors' adaptation of Wagstaff, 2002)



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